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Basic Concepts in Early Education Programs for Children with Hearing Loss in Listening and Spoken Language Classrooms

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BASIC CONCEPTS IN EARLY EDUCATION PROGRAMS FOR CHILDREN WITH HEARING LOSS IN LISTENING AND SPOKEN LANGUAGE CLASSROOMS

by

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ABSTRACT

Teaching of Basic Concepts in Early Education Programs for Children with Hearing Loss in Listening and Spoken Language Classrooms

by

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Mastery of basic concepts is an academic building block for preschool children in early education programs. Research shows that understanding basic concepts (e.g. top, under, fast, now, all, behind, full and short) is important for academic success and higher order thinking. Experts in the field of concept acquisition agree on six strategies for teaching basic concepts. These strategies include: using positive examples and negative examples, highlighting critical features of concepts through continuous conversion, isolating the concept, the order in which the examples are presented, and teaching generalization. This study investigated the extent to which nine preschool teachers of children with hearing loss used four of the six strategies (using examples, non examples, continuous conversion, and isolating the concept) during a 20-minute lesson in which a new basic concept was taught. Results indicated that teachers do well with using

examples to teach basic concepts, but they lack sufficient use of the other three strategies for teaching basic concepts. (51 pages)

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INTRODUCTION

Basic concepts are the building blocks for early education and are frequently used in daily conversations and classroom instructions. Examples of basic concepts for preschool children include big, little, fast, slow, under, and around. "A basic concept is one that cannot be fully described with words (other than synonyms). A communication for a basic concept, therefore, is one that requires concrete examples" (Engelmann & Carnine, 1982, p. 10). Research shows learning basic concepts is important for all young children, whether deaf or hearing. There are several strategies and theories for teaching basic concepts to young children. Experts agree the best way to teach a basic concept is by highlighting the critical features of the concept and by giving examples and non examples of the concept being taught. By highlighting the critical features of a concept, the children learn what attributes define the concept and are able to generalize the use of the concept into additional settings and applications.

Experts in the field of concept acquisition support the effectiveness of teaching basic concepts through specific strategies in the general education curriculum and with children with disabilities. However, there is limited research showing how educators use these strategies for teaching basic concepts to young preschool children with hearing loss. Therefore, this study examined the extent to which these strategies are used by educators to enhance concept acquisition in young preschool children with hearing loss enrolled in programs that emphasize the development of Listening and Spoken Language (LSL) skills, hereafter referred to as LSL programs.

LITERATURE REVIEW

This literature review will first summarize what we know about the importance of children learning basic concepts, including how the acquisition of basic concepts affects academic achievement. Next the strategies for teaching basic concepts will be discussed with definitions, and examples will be given. Strategies for teaching basic concepts are then compared to other teaching methods typically used. Lastly, the literature review will briefly discuss what is known about basic concept acquisition in preschool children with hearing loss.

Learning Basic Concepts is Important for all Children

Basic concepts are the building blocks for early education and language development. According to Boehm (1971), categories of basic concepts include, but are not limited to: temporal concepts (e.g. start, finish, before, slow, now and later) spatial concepts (e.g. top, down, under, over, first, before, together and between), quantity concepts (e.g. many, some, most, both, all, empty and full) and other concepts such as same, different and missing. The Bracken Basic Concept Scale extends its range of basic concepts to include colors, shapes, symbols (numbers and letters), and textures (Bracken, 2006).

Studies show that a strong foundation in basic concepts is positively correlated with higher academic achievement and school success. For example, Sterner and McCallum (1988) compared the Gessell Development Exam (GDE), an assessment used for determining cognitive developmental age, to the Bracken Basic Concept Scale

(BBCS) on their ability to predict academic achievement. The authors reported that the GDE and the BBCS had a positive correlation of .59 with developmental age. This study included 80 kindergarten graduates ranging from ages 5.9-6.9 years old. As shown in Table 1, the GDE, BBCS and the Wide Range Achievement Test-Revised (WRAT-R) were administered to the students, the GDE had a positive correlation with academic achievement of .33 to .48 while the BBCS correlation to academic achievement ranged from .50 to .60. The authors concluded that the understanding of basic concepts is a better indicator of academic achievement than measures of cognitive developmental age such as the GDE.

According to (Klix, 1983) basic language and concept acquisition in preschool and early elementary grades is important for the development of higher-order thinking. Most domains of knowledge originate from basic concepts and the associated relationship between those concepts (Tennyson & Christensen, 1986). Children must have a strong foundation in basic concepts to learn the fundamentals of academic subject areas. For example, one must understand the quantity concepts (e.g., more, less, equal, all, etc.) to

Table 1

Assessment Results for BBCS, GDE and WRAT-R

Assessment	**Mean**	**Standard Deviation**	**Range**
BBCS	96.63	17.46	54-137
GDE	5.73 years	.41	5.0-6.75 years
WRAT-R	94.26	16.18	69-155

do mathematical computations and must know basic reading concepts (e.g., reading left to right, top to bottom, beginning, end, etc.) to learn how to read and write.

When children fail to understand the fundamental concepts essential for higher-order, more complex learning, children who are delayed in language and basic concept acquisition fall behind while children who have mastered these skills tend to make more rapid progress. This is described as the "Mathew effect" by Stanovich (1986) and Walberg and Tsai (1983). The discrepancy between children who are poor in basic concept skill development and children rich in basic concept development continues to grow and eventually affects more complex academic tasks, such as reading. Difficulty in academic tasks, especially one like reading which is integrated into most other subject areas, is often accompanied by feelings of incompetence and inferiority. The way children view their ability to learn is strongly correlated with their academic motivation, effort, and outcomes (Jitendra & Kameenui, 1994).

Furthermore, since the ability to learn basic concepts is important for academic success in all ages and school levels, several pre-kindergarten school readiness assessments test children's acquisition of basic concepts through measuring domains such as expressive and receptive language, cognition, and social/pragmatic skills. Although there is little research directly determining the relationship between basic concepts and academic achievement, there are several studies that address preschool academic skills (which include the understanding of basic concepts) and later academic achievement. It is reasonable to assume that if basic concepts are highly integrated into school readiness assessments, and school readiness assessments are predictors for academic achievement,

then basic concepts are important for school success (Tramontana, Hooper, & Selzer, 1988).

Published assessments of basic concepts include, but are not limited to, the Boehm Test of Basic Concepts (2000), the Battelle Developmental Inventory (2005), the Brigance Early Preschool Screening (1994), Preschool Language Scale (2002), and The Peabody Picture Vocabulary Test (2007). Kaufman (1978) evaluated four major preschool assessments (ITPA, McCarthy, Stanford-Binet, and WPPSI) and found that three of the four standard assessments assumed the understanding of several basic concepts in the individual questions. Items that were specifically testing the understanding of a single concept such as "put the book *under* the table" were omitted from the study. Only test items that assumed the understanding of a basic concept to assess another skill, such as "stay in the *middle* of the path," (testing gross motor) were included in the study. Using Boehm's Test of Basic Concepts as a guide, Kaufman (1978) found 17 assumed concepts that were used in these assessments. Some of the concepts were: after, around, same, different, whole, half, middle, and inside. In the process of developing her assessment, Boehm also created a list of basic concepts that she determined were too easy for her assessment, and even more items from this simpler list were assumed to be understood in these preschool assessments. A few of these simple concepts included: under, big, down, up, and finish.

Basic concepts are included in many routine preschool classroom instructions such as "circle the big hat on your paper," "line up at the door," "put your pencils in your desk," "before we start snack, wash your hands" etc. These directions assume children

understand the temporal (before, start), spacial (on, in), size (big), and shape (line) concepts. When children do not understand these fundamental concepts, they are less able to follow classroom instructions and complete academic tasks.

In addition, reading is considered to be one of the most important skills for academic success (Busch, 1980). Therefore, substantial effort has been devoted to determining what factors predict reading achievement. Busch (1980) assessed 1,052 students ranging in ages 61 to 96 months (5 years 1 month to 8 years) on assessments known to predict reading achievement. Using the Stanford Early School Achievement Letters and Sounds subtest, he determined that there is a .68 correlation between knowing alphabet letters and sounds (phonemic awareness) and reading achievement. The understanding of basic concepts was the next best predictor of reading achievement with a correlation of .58. When children have a weak foundation in basic concepts, their reading comprehension also suffers. Poor reading comprehension negatively affects the child's achievement in all areas requiring reading comprehension skills, namely English, social studies, history, and science (Vernon, 1962).

Effective Strategies for Teaching Basic Concepts

Experts interested in the correlation between basic concept acquisition and academic achievement have synthesized several principles for teaching basic concepts. Before discussing these principles, a few definitions of the term "concept" according to some of these experts are provided below:

> A concept is a set of specific objects, symbols or events which share common characteristics, or critical features and can be referenced by a particular name or symbol. (Tennyson & Park, 1980, p. 56)

> A concept consists of a person's organized information about one or more entities- objects, events, ideas, or processes that enable the individual to discriminate the particular entity or class of entities and also to relate it to other entities or classes of entities. (Klausmeire, 1985, p. 283)

> A concept develops around a prototype, or central example of that concept and branches outward. Anything that resembles the prototype is recognized as an example of the concept and anything that does not resemble the prototype is discriminated as a non example. (Rosch, 1975, p. 9)

By these definitions, concept learning is generalizing all objects or events that represent a class or set as examples of the concept and discriminating non examples of the concept as being outside the class or set.

To understand what experts agree upon as the most effective method for teaching basic concepts, a search was conducted for any articles that discussed specific strategies or methods for teaching basic concepts to children.

Approximately 50 articles were found through a search for any literature discussing the teaching of concepts, either basic or complex. Of those 50 articles, only 20 discussed specific strategies for teaching concepts. Within the 20 articles, 12 articles discussed strategies that could be applied to teaching *basic* concepts to young preschool children. Each article was analyzed to identify the strategies recommended for teaching

basic concepts. The results (shown in Table 2) demonstrated that there was substantial agreement about six specific strategies for teaching basic concepts. The six strategies for teaching basic concepts include:

1) Using Positive Examples
2) Using Non examples
3) Continuous Conversion
4) Isolating the Concept Being Taught
5) The Order Examples are Presented and
6) Teaching Generalization

Definitions of Strategies for Teaching Basic Concepts

The six strategies for teaching basic concepts are defined below and examples are given for using these strategies within an instructional context. Table 2 below represents the frequency each strategy was recommended in the research literature.

Positive examples. All of the experts recommended that a central example (prototype) of a concept be presented followed by several more examples of the concept. By presenting a range of positive examples the entire scope of that concept can be demonstrated. When teaching the concept "dog" one could show pictures of different types of dogs ranging from a Great Dane to a poodle. By showing a wide range of positive examples that are the most different from each other, but still considered as part of the set, children learn to generalize all positive examples as part of that concept class. This is often referred to as the *sameness principle* in the research literature (Tennyson & Park, 1980) .

Table 2

Literature Analysis on Strategies for Teaching Basic Concepts

Author(s)	Continuous Conversion	Positive Examples	Negative Examples	Isolating Concept	Order of Examples	Generalization	Total
(Becker, Engelmann, & Thomas, 1971)	+	+	+	+	+	-	5/6
(Day & Horner, 1986)	-	+	+	+	-	+	5/6
(Engelmann & Carnine, 1982)	+	+	+	+	+	+	6/6
(Gersten, White, Falco, & Carnine)	+	+	+	+	+	-	5/6
(Klausmeier & Hooper, 1974)	+	+	+	+	+	+	6/6
(Martorella, 1972)	-	+	+	+	+	-	4/6
(McKinney, Larkins, Ford, & Davis III, 1983)	+	+	+	+	+	-	5/6
(Merrill, Tennyson, & Posey, 1992)	+	+	+	+	+	+	6/6
(Tennyson & Cocchiarella, 1986)	+	+	+	+	+	+	6/6
(Tennyson & Park, 1980)	-	+	+	+	+	-	4/6
(Van Patten, Chao, & Reigeluth, 1986)	-	+	+	+	+	+	5/6
(Weinheimer & Weisberg, 1987)	+	+	+	+	-	-	4/6
Total	**8/12**	**12/12**	**12/12**	**12/12**	**10/12**	**6/12**	

Non examples. All of the experts suggested that including non examples in the concept being taught helps children identify the critical attributes of the concept and discriminate between positive and negative examples. At first, objects or ideas that are very different from the concept prototype should be presented as non examples for students to learn to discriminate non examples as being outside the set of requirements for that concept. Overgeneralization of concepts is prevented by showing positive and negative examples that are least different from each other (i.e. square and rectangle). Students will then learn the key features that establish a positive example as a representation of the concept, and a non example as not part of that concept. Presenting two similar instances when one is an example and one is a non example of the concept is known as the difference principle. An important rule to follow when teaching with non examples is using non examples that are already part of the child's repertoire. Students should not be exposed to new objects and or concepts as non examples simultaneously with the new target concept being taught (Tennyson & Cocchiarella, 1986).

Continuous conversion. Eight of the twelve experts recommended using continuous conversion to change from one example of a concept to the next example. This is most effective when changing from examples to non examples of the concept being taught. For instance, when teaching the concept "under," a teacher could place a small block under a bridge, then move the block to position it somewhere that is "not under" the bridge. By only changing the relevant features of the concept that makes something under or not under, the students can observe the defining characteristics of being "under." They learn that it is the *change of placement* that is critical for the

concept, not the materials being used because the same materials were used to show an example and a non example of the concept under. Therefore, the use of continuous conversion forces one to create relevant and observable changes in the examples. Each example or non example becomes a modification of the previous example through observable changes, rather than a completely new example (Engelmann & Carnine, 1982).

Isolating the concept. All 12 experts recommended that a concept must be presented in a way that allows for only one interpretation of the concept. For example, if every demonstration of the color red presented to the learner was a circle and every example presented that was not-red was a square, two interpretations of the concept red are presented (Engelmann & Carnine, 1982).The learner may not know that it is the color and not the shape of the example that defines the concept red. Unless one carefully isolates the concept so there is only one interpretation of the examples, the learner may start calling every circle "red." Furthermore, teaching only one concept at a time lessens the chances of confusion and increases the chances of rapid acquisition of new concepts (Martorella, 1972).

Order of examples. Ten of the 12 experts suggested that the order in which concepts are presented determines the efficiency of the teaching sequence. Learners are better able to understand the basic fundamentals of the concept when a teacher starts with easy trials where positive examples are very similar to the concept prototype and non examples are very different from the concept prototype. By strategically increasing the difficulty of the trials by showing a wider range of non examples that are more similar to

the concept prototype and examples that are dissimilar from the concept prototype, under or overgeneralization of the new concept will be prevented (Tennyson & Park, 1980). To minimize the number of examples needed to demonstrate a concept, examples that share the greatest number of features should be juxtaposed with each other. Tennyson and Park (1980) referred to this strategy as the *juxtaposition principle.* This specific strategy is best implemented over a period of time, gradually increasing the order of examples from simple to more complex.

Generalization. All of the experts in the literature review discussed the importance of children generalizing the new concepts they were taught into multiple applications and settings; however, only six of the twelve experts suggested specific ways to teach the generalization of new concepts. These six experts recommended using a variety of examples in several different forms and circumstances (Stokes & Baer, 1977). For instance, when teaching to generalize the color red to other shades of red, one could show several different examples that share a quality of redness. These examples must be given the same defining characteristic by always calling them "red" or by making a pile of all things that are red and excluding objects that are not red. Generalization is a critical part of concept teaching. If children do not generalize new concepts, then learning new concepts serves little function.

Although other strategies were included in the research literature, such as providing a definition of the concept, these strategies were omitted from the literature review because they do not pertain to basic concepts or to young preschool children. For example, providing a definition of a complex concept before beginning instruction

greatly improves student understanding for older students when there are several rules within the concept and it is difficult to understand by examples alone. However, studies have not found this particular strategy to be helpful for teaching basic concepts to young children. Providing more examples and non examples of the concept is much more beneficial when teaching simple concepts (Johnson & Stratton, 1966). Definitions are more critical when teaching higher order thinking and advanced academic concepts. Interested readers should see Anderson and Kulhavy (1972) for more information on providing a definition to teach complex concepts to students.

Examples of Using Strategies for Teaching Basic Concepts

The following examples describe ways in which the six strategies summarized above can be used to teach basic concepts to young children. For example, to teach the concept "dog" examples of several types of dogs should be given (e.g. Alaskan Husky, Bloodhound, Poodle, Bull Dog, Collie, etc.) to help the person generalize from a specific example to other instances of "dog" (Positive Examples). The person learning the concept should also be exposed to non examples of the concept "dog" (cats, pigs, frogs, etc.) to prevent overgeneralization of the concept "dog" (Non Examples). This is taught by highlighting or pointing out the critical features of what makes a dog (four legs, fur, tail, member of the canine species, etc.). However, cats also have fur, four legs and a tail, so the critical differences between a cat and a dog (barking vs. meowing, growling vs. purring, traveling in packs vs. traveling alone, etc.) should be highlighted for the child to discriminate the difference between the two concepts.

It is important to remember to only use non examples that are already in the learner's repertoire and to only teach one new concept at a time. Teaching two new concepts at once increases the chance of confusion, especially when the two concepts are similar. To continue the same example with a dog and a cat, if both concepts are new, learners may have difficulty remembering which critical features are associated with which new concept name. For example, when asked which animal barks, the child might remember learning about dogs and cats, and remember that one of the animals barks, but not remember which one because he learned everything at the same time and did not have a clear distinction between the two concepts.

Another way to highlight defining features of a concept is by using continuous conversion. Continuous conversion demonstrates the change between examples and non-examples while it is occurring. This enables students to focus on the important features of a concept while disregarding the rest (Simmons & Kameenui, 1990). For instance, if a teacher is demonstrating how to read the temperature on a thermometer, he or she might show the mercury in the thermometer rising to indicate that the temperature is getting hotter, and the mercury lowering to show a decline in temperature. The students see that the change in temperature, either rising or falling, is characterized by the movement of the red line on the thermometer, and not by anything else. It is important that students are able to see the change while it is occurring. With some concepts and objects no observable change can be detected during a short period of time, like a thermometer. In these cases an artificial representation of the object that can be easily manipulated by the instructor is very beneficial. Otherwise, students are only able observe a difference in the

thermometer in the morning when they arrive at school and in the afternoon when they leave. Instances like these may result in a misconception of the concept. A child may reason that the thermometer changes based on the time of day, and not by the temperature outside. Along with using continuous conversion, the teacher may also carefully order each example of a rise or decline in temperature. At first, she would start with very easy discriminations or a very visible change in temperature by moving the representation of the mercury in the thermometer a great deal. Overtime, she will provide harder discriminations by only moving the thermometer a little, by introducing negative degrees and even discussing the differences between Fahrenheit and Celsius (depending on her student's learning levels). Generalization may be embedded into the lesson by showing the students how to use and read a variety of thermometers.

Methods of Teaching Concepts

In addition to the six strategies suggested most frequently by experts, there are several other strategies for teaching basic concepts. There is, however, little research on methods and strategies for teaching basic concepts. The following will discuss the information and research that is available on teaching concepts, basic and complex.

McKinney and colleagues (1983) compared three different methods of teaching social study concepts to fourth graders. The first method, referred to as the Tennyson method, from Tennyson and Park's (1980) review of instructional design literature, uses the same six strategies for teaching basic concepts discussed above. The second method, referred to as the Gagne method only uses examples and non examples to teach concepts.

The third method, identified by McKinney et al. (1983) as the method most frequently used in public school systems, is referred to as the reading-recitation model.

The sample in the study by McKinney et al. (1983) included 85 fourth grade students who were randomly assigned to the three treatment groups. Three social studies concept lessons were developed using the three different methods detailed above. The Tennyson method consisted of 12 examples and 12 non examples with definitions that emphasized the critical attributes of each concept. These lessons lasted approximately 15 minutes. The Gagne model included 12 examples and 11 non examples and the sessions lasted about 10 minutes. The reading-recitation lessons also lasted 10 minutes and contained 7-10 examples depending on the lesson. All lessons were scripted to maintain consistency in delivering the lessons with strategies specific to each method.

Following each lesson, thirty items out of a 90-item yes/no assessment were administered to the students in all experimental groups. The results indicated a statistically significant difference among the three groups ($p < .001$). The mean for the Merrill and Tennyson treatment ($\bar{X} = 67.55$) was significantly larger ($p < .05$) than the means for the Gagne treatment ($\bar{X} = 59.45$) and the reading-recitation treatment ($M = 61.59$) (McKinney et al., 1983). Standard deviations were not reported in the research results, so effect sizes could not be computed. The Tennyson method was found to be superior to the Gagne and reading-recitation models¸ but one must consider the time variable when evaluating the validity of this study. The superior results may be attributable to the additional 5 minutes the students using the Tennyson model received instruction on each concept, rather than better quality methods of instruction. An

improved study would control for the time variable by allotting more practice time for the Gagne and the reading-recitation models. McKinney and colleagues (1983) argued that the extra time spent in the Tennyson method to highlight the critical features of positive and negative examples and define the concepts is a key characteristic of this model, and by adding additional time to the Gagne and the reading recitation models one interferes with the original structure of the models. The authors suggested that the extra time spent on each lesson is an inherent part of the Tennyson model and that even when considering the extra time it requires it is still a more efficient method of instruction. Further research controlling for the additional 5 minutes of instructional time is necessary to support this conclusion. Until further research is conducted, it is logical to assume that the Tennyson method is superior on the grounds that the students gained more information in the extra time compared to the Gagne and the reading recitation models.

Another study conducted by Weinheimer and Weisberg (1987) taught the concept "parallel" to third grade students with intellectual disabilities and typically developing children without intellectual disabilities using continuous conversion and without using continuous conversion 91 students without an intellectual disability and 50 students with an intellectual disability were given a pretest on the concept "parallel." The first 30 students from each group who failed the pretest were randomly assigned to the four training conditions. Pretest and posttest results for each training condition are depicted below. The authors concluded that concepts are better attained when using continuous conversion than when not using continuous conversion, but that continuous conversion between trials is more critical for students with disabilities than typically developing

students. The Standardized Mean Difference Effect sizes comparing continuous conversion versus non continuous conversion was .04 for typically developing students and .82 for students with intellectual disabilities (see Table 3).

Strategies for Teaching Basic Concepts to Preschool Children with Hearing Loss

According to Helfand and colleagues (2001), 5000 infants are born each year in the United States with moderate to profound hearing loss. The National Institute on Deafness and Other Communicative Disorders (2000) has stated approximately 90% of infants who are born deaf are born to hearing parents who want their child to share the same communication mode they use. Therefore, there are programs throughout the United States that emphasize Listening and Spoken Language (LSL) skills through the use of hearing aids or cochlear implants for these children. Just like all children, children with hearing loss enrolled in LSL programs need a strong foundation in basic concepts

Table 3

Teaching Concept "Parallel" With and Without Continuous Conversion

Test Phase	Continuous Conversion		Non Continuous Conversion	
	Typically Developing Students	Students with Intellectual Disabilities	Typically Developing Students	Students with Intellectual Disabilities
Pretest				
Mean	9.50	9.29	9.57	9.79
Standard Deviation	4.69	3.67	4.42	2.86
Posttest				
Mean	18.28	17.07	18.21	14.71
Standard Deviation	3.40	3.50	2.95	3.86

Note. Adapted from Weinheimer and Weisberg (1987).

for academic success. No existing literature was found on using strategies for teaching basic concepts to children with hearing loss. In fact, there is very little research on children with hearing loss and the acquisition of basic concepts.

Therefore, this study investigated how LSL classroom teachers utilize the strategies for teaching basic concepts in their daily classroom teaching. The strategies using examples, non examples, continuous conversion, and isolating the concept during instruction were investigated in this study because they can be observed during just one concept lesson. The remaining two strategies, teaching generalization and the order of examples, were omitted from this study because they require observing the teachers' lessons over time. The purpose of this study was to observe a single teaching session of an unlearned basic concept.

Knowing that learning basic concepts is important for all children, including children with hearing loss, and knowing that experts suggest specific strategies for teaching basic concepts, this study proposed to answer the following research question: *To what degree do educators of the deaf use the strategies for teaching basic concepts namely: using examples, non examples, continuous conversion, and isolating the concept?*

METHOD

The following section describes the methods and procedures used in the study, how teachers were recruited to participate, details about the teachers who chose to participate, procedures for conducting the observations and data collection, and the procedures for analyzing the data.

Participants and Setting

Participating teachers were selected from Utah Schools for the Deaf and Blind classrooms that focus on Listening and Spoken Language (LSL) skills for preschool children ages 3-6 with hearing loss. There are nine preschool LSL classrooms between Logan and Provo, Utah who were invited to participate. All nine female teachers in these schools agreed to participate -- two classrooms in Provo, four classrooms in Salt Lake City, one classroom in Ogden, and two classrooms in Logan. Although only nine teachers participated in this study and all participants were women, the sample is still relevant because preschool teachers are predominately female and all the classrooms that focus on LSL development in north-central Utah were included. Participants were recruited by the Utah Schools for the Deaf and Blind state coordinator. Each teacher was contacted by their respective administrative study representative and given a letter of intent for participation in the study. Each teacher was asked to teach a 20-minute lesson on a basic concept of choice and was informed that there would be no negative consequences for teachers who chose not to participate in this study. After the teachers received the letter of intent from their administrator, the teachers were contacted by phone or email to ask

whether or not they would participate in the study. All teachers agreed to participate. All study details, from the informing and recruiting of participants to methods of observation and data collection, were approved by Utah State University's Institute Review Board.

Procedures

Once the teachers confirmed their participation in the study, they were given a list of basic concepts to choose the concept they would teach during the study with which their students were unfamiliar. The basic concepts included on the list were: under, next to, shorter, longer, behind, and bigger. For example, one teacher might select the basic concept "under" while another teacher may choose to teach the basic concept "bigger" based on what students in that classroom had learned previously.

These basic concepts were selected as the target concepts because they are commonly taught in preschool classrooms and are relatively simple concepts to teach. As previously described, the teaching strategies of generalization and order of examples were omitted because they cannot be effectively evaluated or demonstrated based on a one-time observation. The target concepts ranged in difficulty and age of acquisition, thus they provided the teachers with appropriate concepts for their students regardless of their learning levels. According to Englemann and Carnine (1982), comparative (shorter, bigger, longer) and noncomparative concepts (under, next to, behind) are examples of the easiest basic concepts to teach. Comparative concepts have a relative value based on the previous example and have a precise boundary, whereas non comparative concepts are more discrete. For example, the concept "under" is always a positive example if there is an object under another, regardless of the previous example used by the teacher. The

conceptual illustration does not depend on previous examples as it does for comparative concepts, such as demonstrating "bigger", which relies on a comparison with a previous example. With the specific characteristics of comparative and noncomparative concepts, utilization of the strategies, such as continuous conversion, will be clearer and more discrete.

During the 20-minute period during which the selected concept was taught, the researcher completed an observation form to measure the extent to which teachers used each of the four strategies to teach basic concepts (see Appendix A). Consistency throughout the data collection was maintained through a consistency cross-check. A second researcher observed four of the nine observation sessions to ensure that data were collected consistently across all teachers and activities during the study. Before the researchers began observing in the classrooms, they generated a list of rules for coding each observation (see Appendix C). The first observer recorded data during each observation and the second observer ensured that the same rules were followed across all observations to keep the data consistent from the first observation to the last. All observations were completed within a two week period.

Data recorded on each form were analyzed to measure the extent to which the strategies, namely positive examples, negative examples, continuous conversion, and isolating the concept were used to teach basic concepts to young children with hearing loss in northern Utah (see Appendix B for data analysis sheet).

The research literature provides little guidance on the expectations of frequency or quantity of implementation of the four strategies for teaching basic concepts during a

20-minute lesson. However, there are several suggested lesson plans that detail how to implement each of the four strategies for teaching basic concepts. Englemann and Carnine (1982) provide over 100 lesson outlines for teaching basic to complex concepts using these strategies. Of these lesson outlines, approximately 20 of them were geared toward preschool children and could be taught within a 10 minute lesson. Four of these lessons were randomly selected to generate guidelines for the frequency these strategies should be implemented during a 20-minute lesson for preschool children. Based on the examples given by Engleman and Carnine (1982), it was estimated that when teaching a new concept, 6-8 examples should be used, 5-6 non examples, 9-12 instances of continuous conversion should be used, and the concept should always be isolated. (See Table 4 for more details.)

Table 4

Sample Lesson Plans for Using Strategies for Teaching Basic Concepts

Strategy	**Examples**	**Non Examples**	**Continuous Conversion**	**Isolating Concept**
Lesson 1	7	6	11	Yes
Lesson 2	6	6	9	Yes
Lesson 3	8	5	12	Yes
Lesson 4	7	6	11	Yes

Note. Lesson plans taken from Englemann and Carnine (1982).

RESULTS

The observation form shown in Appendix A was used to collect the data during the observations and the data analysis form in Appendix B was used to analyze and rate the data for each teacher. Table 5 below shows the frequency with which each strategy was used during a 20-minute lesson by each of the nine teachers.

The data were analyzed using the data analysis form shown in Appendix B. For the strategies using examples, non examples, and continuous conversion, the teachers were given a rating of 1 to 3 based on their implementation of these strategies. For instance, a teacher who used continuous conversion five or more times during their lesson received a rating of 3 and teachers who used continuous conversion zero to one times in their lesson received a rating of 1. The strategy of isolating the concept received a rating

Table 5

Observation Data on Strategies for Teaching Basic Concepts

Teacher → / **Strategy ↓**	Teacher 1	Teacher 2	Teacher 3	Teacher 4	Teacher 5	Teacher 6	Teacher 7	Teacher 8	Teacher 9	**Total**
	5 Students	6 Students	6 Students	6 Students	5 Students	7 Students	4 Students	7 Students	5 Students	
Unique Examples	5	11	5	5	11	16	9	16	6	**84**
Total Examples	10	28	14	29	30	21	12	16	27	**187**
Unique Non Examples	0	5	1	1	1	0	0	0	*3*	**11**
Total Non Examples	0	5	1	1	1	0	0	0	10	**18**
Continuous Conversion	0	2	0	1	1	0	0	0	0	**4 (4.21%)**
Isolating Concept	No	Yes	No	No	Yes	No	Yes	Yes	Yes	**5/9**

of 1 or 2. Teachers who only taught one concept during the lesson received a 2 and teachers who taught more than one new concept at a time received a 1. The highest possible rating for implementing these strategies was 11 and the lowest possible score a teacher could receive was 5. The teachers' use of the strategies for teaching basic concepts ranged from a rating of 5 to 9. See Table 6 for more details on the data analysis followed by a narration of how each strategy was or was not implemented.

Table 6

Teachers Ratings on Using Strategies for Teaching Basic Concepts

Teacher #	1	2	3	4	5	6	7	8	9
Examples (1-3)	2	3	2	2	3	3	3	3	3
Non Examples (1-3)	1	2	1	1	1	1	1	1	2
Continuous Conversion (1-3)	1	2	1	1	1	1	1	1	1
Isolating the Concept (1-2)	1	2	1	1	2	1	2	2	2
Total out of 11	Total 5	Total 9	Total 5	Total 5	Total 7	Total 6	Total 7	Total 7	Total 8

Discussion

Each of the four strategies for teaching basic concepts were, to some extent, observed in the teachers' individual lessons. Some strategies were implemented more than others, and not all teachers used each strategy. A summary and examples of how each strategy was or was not used by the nine teachers is discussed below.

Examples

The teachers in this study used many examples to demonstrate the basic concepts they chose to teach, namely behind, bigger, longer, shorter, and under. Across the nine teachers observed, the number of examples used during the 20 minute lesson on a new concept ranged from 5 to 16 examples with a mean of 7.55. There was variety in the types of examples the teachers used to teach the concept, even when the teachers chose to teach the same concept. For example, when teaching the concept under, one teacher asked the students to go under different objects around the room, another teacher had the children place different objects under a particular item and yet another teacher read a book showing several animals going under a variety of nature's landmarks.

When teaching the concept "shorter" one teacher compared the length of several objects to each other (rope, trains, tails, hair, etc.). Each comparison of the length of the objects was recorded as one example. The length of a rope compared to a shorter rope, the length of rope compared to a train, and the length of the train compared to a horse's tail all count as one separate example. Another teacher compared the height of all the children and had each child stand up to see whether or not they were shorter than the teacher. Even though this example was presented multiple times, it was only recorded as one example. One strategy all the teachers used in this study, some more than others, was frequent repetition and reinforcement of new language associated with the concept. Some teachers used the same example several times within the lesson to help reiterate the concept and to give each child an opportunity to respond. The following dialogue illustrates a typical segment of part of all nine teachers' lessons: Teacher: "Look Sally,

the train is shorter than the rope. See George, the train is shorter than the rope. Look Mary, the rope is long, and the train is shorter than the rope. Steve, which one is shorter? Yes, the train is shorter than the rope. Steve, tell Ryan." Although the example is shown and described several times, it was only recorded as one example because there was only one unique configuration. When counting all examples, including examples that were repeated multiple times as in the dialog above, the teachers used a range of 10-30 examples with a mean of 18.5 examples within a 20 minute lesson.

Non Examples

The teachers rarely used non examples to demonstrate a new concept. However, two teachers took advantage of opportunities to discuss non examples when students did not follow the direction correctly. For example, during one lesson a teacher instructed a student to go under an object, but the student went on top of the object instead. The teacher said, "Look, she is *not* under, she is *on."* Since her students had already mastered the concept "on," (as reported by the classroom teacher) this was counted as a non example. Other teachers contrasted the examples of the concept with other unlearned concepts such as tall and long when teaching the concept shorter. These were not counted as non examples, because the teachers reported that these other concepts were not mastered by the students. After each observation session the researchers met with the teachers to discuss which concepts the children were familiar with prior to the teaching session.

Other concepts presented aside from the target concept were only recorded as non examples if the students were familiar with the concept, or if the teacher used simple

wording to define the non example (“not under”, instead of “on top”). The teachers observed in the study used a range of 0-5 non examples during the 20-minute lesson with an average of 1.22 non examples. Four of the nine teachers did not use any non examples and three teachers only used one non example in their lesson. Non examples seem to be less intuitive to use during the instruction of new concepts than examples, but research shows non examples are just as critical for setting up the parameters of a new concept, as discussed earlier in the literature review (Engelmann & Carnine, 1982).

Only two teachers used more than one non example during their lesson. One of the two teachers used five non examples, but each one consisted of someone being on top rather than under the five different objects when the target basic concept was under, and the other teacher showed her students something that was not shorter than the item and something that was longer than the item with the target basic concept shorter.

Continuous Conversion

The teachers rarely used continuous conversion to demonstrate new concepts. The few times it did occur, it seemed to be incidental, but these occurrences were still recorded in the data. For example, when teaching the concept “behind,” one teacher tapped sticks together behind her back and asked her students to do the same. One student was incorrectly tapping the sticks in front of himself. The teacher then tapped her sticks in front of her and said “you are tapping your sticks in front of you like this; I want you to tap your sticks behind you (while moving her sticks behind her back).” This was counted as continuous conversion because the students witnessed the critical change in movement that distinguished in front from behind. Throughout all nine observation sessions,

continuous conversion was only used a total of four times. The use of continuous conversion ranged from 0 to 2 occurrences with a mean of 0.4 occurrences. There is potential for continuous conversion within each example and non example. The total combined number of examples and non examples for all nine teachers was 95. With four instances of continuous conversion only 4.21% of examples and non examples utilized continuous conversion throughout all the lessons observed. The teachers' use of continuous conversion appeared to be random, and not systematically integrated into the teachers' daily lessons.

Isolating the Concept

When teaching a new concept, it is important to teach only one concept at a time to ensure the smallest chance of confusion (Stokes & Baer, 1977). About half the teachers (five of nine) observed in this study isolated the concept when introducing a new concept. The remaining four teachers taught multiple new concepts at the same time. Most of the teachers integrated other preschool skills aside from the target concept within the lesson. Common skills addressed include: basic colors, shapes, numbers, listening skills, and language acquisition. Deaf education research shows, this is highly appropriate when teaching preschool children with hearing loss who require language-intensive instruction. (Teagle & Moore, 2002). Children with hearing loss have fewer opportunities to learn through incidental listening, or overhearing conversations and picking out key words and concepts. For example, children with normal hearing often learn the primary colors by overhearing other children and adults label objects by color. Children with hearing loss may miss these key words and descriptors during conversations and therefore may need

to be taught the primary colors more purposefully (Davis, 1974). Teachers of children with hearing loss are constantly working on developing their students' listening, language, and academic skills. They spend a large portion of their time ensuring receptive understanding and encouraging expressive responding. Teachers who addressed previously taught skills as part of their lesson, and did not attempt to teach an additional new concept or skill, were still considered to be isolating their target basic concept during instruction.

CONCLUSION

The teachers of children with hearing loss enrolled in LSL programs observed in this study do well with using examples in their lessons. In general, they provide a wide variety of examples and give children multiple opportunities to participate in the activity and learn the new vocabulary. However, the teachers rarely used non examples to teach basic concepts during the lessons observed. When non examples were used, the majority of the non examples were student errors that the teacher corrected, rather than intentional teaching of a non example. Continuous conversion was also used very little, only 4.21% of examples and non examples used were continuously converted. Six of the nine teachers did not use continuous conversion in their lessons at all and the three remaining teachers only used continuous conversion 1 to 2 times. About half the teachers, five of the nine, isolated the concept by teaching only one concept at a time.

Based on the nine teacher observations, these teachers are currently not using most of the effective strategies for teaching basic concepts to young children. Since the acquisition of basic concepts is critical for student success, teachers may benefit from more instruction on strategies for teaching basic concepts to preschool children with hearing loss, thus benefiting their students as well.

It is important to note that the teachers observed in this study work with a special population of children. Children with hearing loss who are learning spoken language and listening skills require specific teaching strategies to foster listening and language development. There were several other strategies the teachers embedded within their lessons to encourage the use of expressive language and receptive listening skills. These

skills are not mentioned in the literature for teaching basic concepts, but are highly appropriate for this target population.

Readers should also note that all six strategies of instruction will not be necessary for all learners. For example, in the Weinheimer and Weisberg (1987) study discussed earlier, the students with intellectual disabilities benefited from the implementation of these strategies much more than the students without disabilities. There is a relation between the learner's aptitude and the need for more intensive instruction. Cook and Schirmer (2005) indicated that this very principle is what makes special education "special." One must design careful and precise (special) instruction for learners with language and or cognitive delays. Therefore, the authors do not claim that all six principles of instruction are always critical for all students. However, when teaching students with additional needs who are struggling to learn a basic concept, experts agree that teachers who effectively incorporate more of the six principles during instruction will significantly increase the effectiveness of the instruction.

Limitations

The main limitation of this study is the small sample size of teachers of children with hearing loss. One cannot generalize the data and conclusions recorded in this study to all teachers or children with hearing loss in LSL classrooms. Also, each teacher was only observed once during a single teaching session. It is possible that the teachers may have the skills and knowledge necessary to teach using the four strategies for teaching basic concept, but they were not observed using those strategies during that particular teaching sequence. The teachers, however, had a week to prepare the lesson and were

informed that they would be observed on the strategies they used to teach the basic concept. Therefore, it is reasonable to assume that the teachers taught the basic concept using their best strategies and skills.

A third limitation is that this study only observed four of the six strategies recommended for teaching basic concepts. The strategies of teaching generalization and systematically ordering the presentation of examples were omitted from this study and should be investigated in future research.

Future Research

Future research should observe a larger population of teachers of children with hearing loss enrolled in LSL programs. As mentioned previously, one cannot assume that all teachers of children with hearing loss are not using these strategies for teaching basic concepts based solely on the nine teachers observed in this study. It would also be beneficial to observe how the teachers use these strategies over time to observe the use of generalization and order of examples. The theoretical implications of using, or not using these strategies would be better supported by research on how teachers of children with hearing loss are teaching basic concepts, with data on the preschool children's acquisition of basic concepts.

Recommendations

Based on the small sample of teachers of children with hearing loss observed in this study, teachers could benefit from training on strategies for teaching basic concepts. An in-service training could include the definitions of each strategy with several

examples of how to use these strategies within a lesson plan on a basic concept. Schools could use the observation form provided in Appendix A, or a similar observation form to measure how well their teachers are using these strategies and to evaluate training needs. The rules for using the observation form are included in Appendix C.

Experts agree that these six strategies for teaching basic concepts improve student understanding, therefore, it is recommended that teachers learn and use these strategies to better teach their students the basic concepts and skills they need for academic success.

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APPENDICES

Appendix A

Observation Form

Observation Form

Teachers Name: Concept Taught: Date: | Time :			
Examples			
Number of examples (unique objects or configurations) and short description			
Non Examples			
Number of examples (unique objects or configurations) and short description			
Continuous Conversion			
Frequency CC was used between examples and description of how it was converted			
Isolating the Concept: was only one concept taught at a time?	No	YES	List other concepts Taught:
Notes: List and describe other strategies the teacher used:			

Appendix B

Data Analysis

Data Analysis: To what extent were the strategies implemented?				
Data Analysis	**1**	**2**	**3**	**Rating**
Examples				
Number of unique examples (unique objects OR configurations)	0-2 examples	3-5 examples	6+ examples	
Non Examples				
Number of unique examples (unique objects OR configurations)	0-2 examples	3-5 examples	6+ examples	
Continuous Conversion	CC used in 0-1 demonstrations	CC used in 2-4 demonstrations	CC Used in 5 or more demonstrations	
Isolating the Concept: was only one concept taught at a time?	No	Yes		
Notes: List and describe other strategies the teacher used:				Total

Appendix C

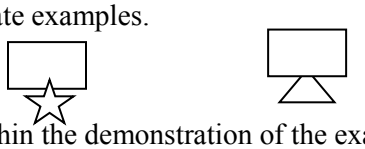
Rules for Observations

Rules for Observations

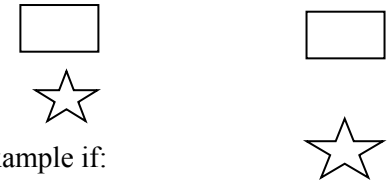
Examples (Positive or Negative)

Count as example if:

- Item presented in the demonstration is unique from other items used in examples. Teaching the concept UNDER: the star is under the box and the triangle is under the box are two separate examples.



- The range within the demonstration of the example is unique, even if the same item/object has been used previously. Teaching UNDER: the star is under the box in both examples, but with a unique configuration or distance.



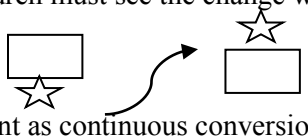
Do not count as example if:

- The exact same example has already been demonstrated, even if to different children. Teaching the concept UNDER: the star is under the box presented to Child A and the star is under the box presented to Child B; count as one example.

Continuous Conversion

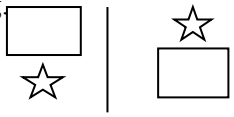
Count as continuous conversion if:

- Must show relevant change by only changing one or two features to turn a non example into an example or an example to a non example. Teaching the concept UNDER: The teacher places the star under the box for a positive example, and the children watch her move the star to the top of the box for a negative example.
- Children must see the change while it is occurring.



Do NOT count as continuous conversion if:

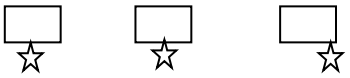
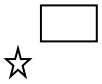
- Demonstrations do not show the change while it is occurring: Teaching the concept UNDER: The two examples are presented statically and the children do not witness the change while it is occurring.



Isolating the Concept

- Teach only one novel concept at a time. Teaching concept UNDER: If children have not mastered the concept "on top" teach the concept "under" using the vocabulary "under" and "not under."
- Make a list of concept that were taught or mentioned in the teaching sequence and ask the teacher at the end of the session which concepts the children had already mastered.

Order of Examples

1. Examples and non examples are presented in a random order.
    - There is no clear intentional ordering, or examples are presented in a predictable manner (positive examples, non example, positive example, non example, etc.).
2. Examples are presented in order from easy discriminations to more difficult discriminations
    - Instructional trials begins with easy discriminations to build behavioral momentum and student success
    - Trial shifts from easy discriminations (positive examples are similar to prototype examples and negative examples are very dissimilar to prototype example) to more difficult discriminations (positive examples are very dissimilar to prototype examples and negative examples are similar to prototype example).
3. Instructional sequence begins with sameness in positive examples and moves to minimally different non examples.
    - Sameness: demonstrates a wide range of positive examples. Teaching the concept under: 
    - Difference: demonstrates non examples that are minimally different than positive examples. Teaching the concept under using non examples of under: 


Expansion

Count as expansion if:

- There is a clear distinction between initial instruction and expansion trial. If yes, see next point.
- The teacher's wording, required response type from the child or the materials used were changed.

Do not count as expansion if:

- The teacher's wording, child's response type or the materials are scattered throughout the initial instruction.

There is not a clear distinction between initial instruction and expansion trials.